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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Steven Morrison

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INTELLECTUAL PROPERTY DEPARTMENT
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EXAMINER

BROOKS, JULIAN D

ART UNIT

PAPER NUMBER

2624

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/580,876	Applicant(s) MORRISON ET AL.	
	Examiner JULIAN D. BROOKS	Art Unit 2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 March 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 12, 15, 23 and 24 is/are rejected.
- 7) ☒ Claim(s) 4-11 and 16-22 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 May 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1-24 are pending in this application.

Priority

2. Examiner acknowledges that this application is a national stage entry of earlier filed PCT/GB04/04981, filed on 11/25/2004, which claims foreign priority to UK 0327339.8 filed on 11/25/2003.

Drawings

3. The Drawings filed on 05/25/2005 are approved for examination purposes.

Claim Objections

4. Claims 4-11 and 16-22 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot depend from any other multiple dependent claim. See MPEP § 608.01(n). Accordingly, the claims have not been further treated on the merits.

EXAMINER NOTE

Claim 1 recites the phrase “image processing means”. Examiner notes that the phrase is equivalent to “means for image processing” and thus invokes interpretation

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under 35 U.S.C 112, sixth paragraph. See *Signtech USA, Ltd. v. Vutek, Inc.*, 174 F.3d 1352, 1356, 50 USPQ2d 1372, 1374– 75 (Fed. Cir.1999) (“ink delivery means positioned on ...” invokes 35 U.S.C. 112, sixth paragraph, since the phrase “ink delivery means” is equivalent to “means for ink delivery”). Therefore, the “means” that performs the image processing shall be interpreted as disclosed in the specification.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. **Claims 1-2 are rejected under 35 U.S.C. 112, first paragraph, because the original abstract, while being enabling for an image processor, the abstract or specification does not reasonably provide enablement for a single image processing means as claimed in claim 1. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims.**

- Applicant’s specification fails to explicitly link the means to any particular structure of form. While one skill could construe the means to be a processor, as claimed, the scope encompasses just a user or possibly a camera or any other electronic device known and not yet known. Therefore

Applicant's specification does not have support for the single means image processing means.

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. **Claims 1-3 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.**

- Claim 1 recites an "image processing means", which invokes interpretation under 35 U.S.C. 112 sixth paragraph, and thus the corresponding structure of the means limitation must be disclosed in the specification itself in a way that one skilled in the art will understand what structure will perform the recited function. However the specification fails to set forth an adequate disclosure, thus applicant has in effect failed to particularly point out and distinctly claim the invention as required by the second paragraph of section 112. The image processing means is merely repeated in the specification as recited in the claims without any further defining structure illustrating the means. Lines 5-14 of Applicant's specification discuss interacting with images on a computer screen through a computer tool; however the actual image processing means appears to be the user. Examiner notes that the provided abstract submitted with WO2005/053314 recites "An image processor" for applying the image

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processor and mosaicing. Examiner suggests amending the specification and claim to recite "an image processor provided with...".

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 23 and 24 are rejected under 35 U.S.C. 102(b) as being anticipated by Dickson et al, NPL: Mosaic generation for Under Vehicle Inspection, published 2002, [herein Dickson].

With respect to claim 23, Dickson discloses "A method of creating a reference map of an object" (Abstract and Figure 6, map corresponds Dickson's 3D representation of vehicle undercarriage),

"the method comprising the steps of obtaining a single mosaiced image" (Pages 251-252, bridging paragraph, and Pages 254-255, section 2.2, and Figure 6), "selecting an area of the single mosaiced image and recreating or selecting the frame from which said area of the mosaiced image was created" Page 255, Section 2.2, lines 5-10).

With respect to claim 24, Dickson discloses "the area of the single mosaiced image is selected graphically by using a cursor on a computer screen" (see Figure 6).

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. **Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Frantz, U.S. Patent Application Publication No. 2003/0185340, [herein Frantz], in view of Kumar et al. U.S. Patent No. 6173087, published on 01/09/2001, [herein Kumar].**

With respect to claim 1, Frantz discloses “Apparatus for inspecting the under side of a vehicle” (abstract, inspect underside corresponds to Frantz’s image undercarriage),

“the apparatus comprising: a plurality of cameras located at predetermined positions and angles relative to one another” (See figures 4 and 5, and Page 5, paragraph 0069), “the cameras pointing in the general direction of the area of an object to be inspected” (See figure 5 and Pages 4-5, paragraph 0068, the cameras point upward toward the vehicle); and

“image processing means” (See Figure 1, means corresponds to Frantz’s computer),

“provided with a second module for constructing an accurate mosaic from said altered image frames” (Pages 6-7, paragraphs 0095-0103, module corresponds to Frantz’s processing software).

It is however noted that Frantz fails to disclose “a first module for calibrating the cameras and for altering the perspective of image frames from said cameras”, as claimed.

On the other hand Kumar teaches “a first module for calibrating the cameras and for altering the perspective of image frames from said cameras” (Col. 2, lines 24-32, and Cols. 11-12, lines 50-67 & 1-7, respectively and Col. 9, lines 3-6, and Figure 12, Kumar teaches lens correction as camera calibration and applies the determined parameters for perspective correction when mosaicing the image).

It would have been obvious to one of ordinary skill in the art to incorporate the correction for lens distortion into the vehicle inspection system of Frantz because both

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Frantz and Kumar are directed to imaging systems in which multiple images are captured through imaging devices and processed to form a composite image. Furthermore, Kumar notes in Col. 2, lines 24-27, that lens distortion is a common imaging phenomenon for cameras, resulting in none of the captured images being ideal, and Kumar teaches the correction of lens distortion as a preprocessing step to further processing. Therefore, it would have been obvious to apply the known technique of preprocessing to correct for lens distortion as taught by Kumar to improve the vehicle image processing of Frantz for the predictable result of enabling Frantz's captured images to be corrected for common camera distortions, and therefore creating a more ideal image for subsequent processing as suggested and taught by Kumar.

With respect to claim 2, Frantz as modified by Kumar teaches “the cameras are stationary with respect to the vehicle” (Frantz: Page 4, paragraphs 0066-0067, Frantz teaches that the vehicle passes over the camera).

With respect to claim 3, Frantz as modified by Kumar teaches “the plurality of cameras are arranged in a linear array” (Frantz: See figures 4 & 5).

With respect to claim 12, Frantz discloses “A method of inspecting an area of an object” (Abstract, Frantz inspects an undercarriage of a vehicle),

“the method comprising the steps of: (a) positioning at least one camera, taking n image frames, proximate to the object” (See figures 5,6,10, & 11 and Page 7, paragraph 0099);

“(b) acquiring a first frame from the at least one camera” (Page 5, Paragraph 0080, Page 7, paragraph 0099 and figures 14 and 10, acquiring a first frame correspond to Frantz obtaining image 110a for example);

“(c) acquiring the next frame from said at least one camera” (Page 7, paragraph 0099 and figures 14 and 10, acquiring a first frame correspond to Frantz obtaining image 110b for example);

“(e) calculating and storing mosaic parameters for said frames;” (See Figure 14, mosaic parameters correspond to Frantz common image features within the images due to overlapping camera fields and vehicle speed, all of which is stored),

“(g) mosaicing together the n frames from said at least one camera into a single mosaiced image” (Figured 10 and 14, and page 7, paragraphs 0099-0100, n frames from at least one camera corresponds to Frantz frames stitched together to create a strip).

It is however noted that Frantz fails to disclose “(d) applying calibration and perspective alterations to said frames”; and thus also fails to disclose

“(f) repeating steps (c) to (e) $n-i$ times”, as claimed by failing to disclose the calibration and perspective alterations. Franz discloses interactively acquiring frames and calculating mosaic parameters for the newly acquired frame, but fails to apply calibration and alterations as claimed.

On the other hand Kumar similarly teach capturing a plurality of images and calculates frame to frame alignment parameters as well as “(d) applying calibration and perspective alterations to said frames”(Col. 2, lines 24-32, and Cols. 11-12, lines 50-67 & 1-7, respectively and Col. 9, lines 3-6, and Figure 12, Kumar teaches lens correction as camera calibration and applies the determined parameters for perspective correction when processing each image for mosaicing), and therefore,

Frantz and modified by Kumar teaches “(f) repeating steps (c) to (e) $n-i$ times” (Frantz: Page 7, paragraphs 0099-0102 and figure 10, Frantz processes sequential adjacent image frames, therefore by way of illustrated example, three stitching processes are required for the 4 captured images)

It would have been obvious to one of ordinary skill in the art to incorporate the correction for lens distortion into the vehicle inspection system of Frantz because both

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Frantz and Kumar are directed to imaging systems in which multiple images are captured through imaging devices and processed to form a composite image. Furthermore, Kumar notes in Col. 2, lines 24-27, that lens distortion is a common imaging phenomenon for cameras, resulting in none of the captured images being ideal, and Kumar teaches the correction of lens distortion as a preprocessing step to further processing. Therefore, it would have been obvious to apply the known technique of preprocessing to correct for lens distortion as taught by Kumar to improve the vehicle image processing of Frantz for the predictable result of enabling Frantz's captured images to be corrected for common camera distortions, and therefore creating a more ideal image for subsequent processing as suggested and taught by Kumar.

With respect to claim 13, Frantz as modified by Kumar teaches "wherein the object is the underside of a vehicle" (Frantz: See Figures 9-13).

With respect to claim 14, Frantz as modified by Kumar teaches "wherein a plurality of cameras is provided" (See Figure 5), "each located at predetermined positions and angles relative to one another" (See figures 4 and 5, and Page 5, paragraph 0069), "the cameras pointing in the general direction of the object" (See figure 5 and Pages 4-5, paragraph 0068, the cameras point upward toward the vehicle).

With respect to claim 15, Frantz as modified by Kumar teaches "wherein the predetermined position of each of said cameras is calculated as a function of the

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camera field of view and/or the angle of the camera to the vertical and/or the vertical distance between the camera and the position of the vehicle underside” (Page 5, Paragraph 0069).

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Cited NPL teach camera calibration and lens distortion correction as related to image mosaicing.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JULIAN D. BROOKS whose telephone number is (571)270-3951. The examiner can normally be reached on Monday to Thursday EST 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vikkram Bali can be reached on 571-272-7415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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08/14/2010

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